REMARKS

In the Office Action of September 26, 2002, Claims 1 - 3 and 10 - 16 were rejected. No claim was allowed. Claims 1, 10, 11, 12 and 16 are amended. Reexamination and reconsideration are respectfully requested in view of the foregoing amendments and the following remarks.

Objection to the Amendment to the Specification

The Examiner objected to the amendment filed on September 20, 2002 on the alleged grounds that it contains new matter. In particular, the Examiner alleged that the specification does not support the amendment in Example 4 to provide that the curing accelerator is 1-cyanoethyl-2-methylimidazolium trimellitate (2MZ-CNS). Although Table 1 lists the curing accelerator as being "2MZ-CNS", and the page (attached to the amendment of September 20, 2002) from the Catalogue of Chemical Products distributed by Shikoku Chemical Corp shows that 2MZ-CNS is 1-cyanoethyl-2-methylimidazolium trimellitate, the Examiner alleges that there is no documentation indicating whether the C11Z of the description of Example 4 on page 25 or the tabulated 2MZ-CNS in Table 1 is the actual curing accelerator utilized.

In response, Applicants submit a Declaration of Kenichi Tomioka stating that 1-cyanoethyl-2-methylimidazolium trimellitate was the actual curing accelerator utilized and providing a translation of the Shikoku Chemicals Catalogue to show that the abbreviation 2MZ-CNS in Table 1 stands for 1-cyanoethyl-2-methylimidazolium trimellitate, as indicated in the Amendment filed on September 20, 2002.

Accordingly, it is respectfully submitted that the amendments to the specification submitted in the Amendment filed on September 20, 2002 are not new

matter. Withdrawal of the requirement to cancel the amended matter is respectfully requested.

Amendment to the Specification

Table 2 is amended to correct several minor clerical errors. In particular, the Declaration of Kenichi Tomioka states that in Table 2 on page 32 of the specification, the value "0.4" of water absorption (%) of Comparative Example 6 is in error and the value should be --0.7--. The value "3.8" of the specific dielectric constant (1MHz) of Comparative Example 9 is in error and should be --4.8--. Entry of the amendment correcting the minor clerical errors of Table 2 is therefore respectfully requested.

Amendments to Claims 1, 10, 11, 12 and 16

Claims 1, 10, 11, 12 and 16 are amended to delete the term "type" from the claims as requested by the Examiner. Claim 16 is further amended to use proper Markush language as requested by the Examiner.

Further, Claims 1 and 11 are amended to specify that component A is "a prepolymer of a cyanate compound containing two or more cyanato groups in one molecule thereof with a conversion of the monomer of 10 to 70 mole%. This limitation is supported in the specification on page 11, lines 14 - 15 and page 12, lines 1 - 3. Accordingly, it is respectfully submitted that the amendments to Claims 1 and 11 do not constitute new matter.

Rejection of Claims 1 - 3 and 10 - 16 under 35 U.S.C. §103(a) over Hefner, Jr. in view of Dersh m and Namba et al or JP Nos. 61-291615 or 2-214741

Claims 1 - 3 and 10 - 16 were rejected under 35 U.S.C. §103(a) as obvious over Hefner, Jr. (U.S. Patent No. 4,612,359) in view of Dershem (U.S. Patent No. 5,969,036) and Namba (U.S. Patent No. 4,764,571) or JP 61-291615 or JP 2-214741. The Examiner states that the rejection is for reasons of record in the previous Office Action.

In response, independent Claims 1 and 11 are amended to specify that the component A is a prepolymer of a cyanate compound containing two or more cyanato groups in one molecule thereof with a conversion of the monomer of 10 to 70 mole%. As described in the specification on page 12, lines 4 - 13, when component A is a prepolymer, there are obtained the advantages that the cyanate compound is not recrystallized in a varnish, smoothness of the prepreg surface can be obtained, and pot life of the varnish is maintained without deterioration. This feature is neither disclosed nor suggested in the cited references.

The Examiner further takes the position that the comparison between Example 1 vs. Comparative Examples 1 and 2 in Table 1 on page 29, as well as Example 5 vs. Comparative Examples 6 and 7 in Table 2 on page 32 of the specification are inconclusive. The Examiner notes that Example 1 contains 95 parts by weight of the dicyclopentadiene epoxy resin and 55 parts by weight of the brominated bisphenol A epoxy resin and that Comparative Example 1 contains 65 parts by weight of bisphenol A epoxy resin and 55 parts by weight of the brominated bisphenol A epoxy resin. The Examiner further notes that Example 5 contains the same proportions of the identical species of epoxy resins as Example 1, that Comparative Example 6 contains the same types and amounts of epoxy resins as

Comparative Example 1 and that comparative Example 7 contains the same species and contents of epoxy resins as Comparative Example 2. The Examiner alleges that it cannot be ascertained whether the differences in evaluation results is a consequence of the claimed dicyclopentadiene epoxy resin over the bisphenol A epoxy resin of Henson. The Examiner alleges that the difference could also be a function of the diverse amounts of dicyclopentadiene epoxy resin vs bisphenol A epoxy resin and the additional presence of the brominated bisphenol A epoxy resin in examples 1 and 5 with respect to the comparison of Example 1 vs Comparative Example 2 and Example 5 vs Comparative Example 7.

In response, Applicants note that although in Comparative Example 1, the weight of DER331L is smaller than that of HP7200H in Example 1, the molar ratio of functional groups in each component is equal. The same applies to Example 5 and Comparative Example 6. Accordingly, the differences in evaluation results may be considered to be a consequence of the claimed dicyclopentadiene epoxy resin over the bisphenol A epoxy resin of Henson and not a function of the diverse amounts of dicyclopentadiene epoxy resin vs bisphenol A epoxy resin.

As further support for the Applicant's position that the differences in evaluation results are a consequence of the claimed dicyclopentadiene epoxy resin over the bisphenol A epoxy resin of Henson, Applicants present the attached Declaration of Mr. Tomioka, wherein it is shown in the Table on page 5 of the Declaration that when the weight of DER331L is made the same as that of HP7200H in Example 5, properties of Experiment 1 are further decreased even compared with Comparative Example 6, particularly in the glass transition temperature.

The cited references may be further distinguished as follows: As to the function of the antioxidants, Dershem discloses a paste (a composition) for attaching

a semiconductor device to a substrate (see claim 1 of Dershem). An antioxidant may be added (column 8 lines 38-42, particularly line 42), but its special function as required in the present invention is not described nor suggested. Further, since the use of the compositions of Hefner, Jr. (see column 12 lines 47-57) is quite different from that of the present invention, a person skilled in the art would not expect that the composition of Hefner, when antioxidant of Dershem is added thereto, can be used in the field of wiring boards without having a bad effect on the properties required for the wiring boards. According to the present invention, the antioxidant is used for improving insulating characteristics (see page 19 lines 4-8 of the present specification) and to improve galvanic corrosion resistance (or metallic migration resistance) (see page 23 lines 23-25), even under high humidity environment (see page 3 line 22 to page 4 line 7 of the present specification). Such effects of the present invention are not taught or suggested by Hefner, Jr. and Dershem and the combination of these references is merely hindsight on the part of the Examiner without technical justification.

Accordingly, it is respectfully submitted that Claims 1 - 3 and 10 - 16 would not have been obvious over Hefner, Jr., Dershem, Namba , JP 61-291615 or JP 2-214741, alone or in combination.

Conclusion

In view of the foregoing amendments and remarks, it is respectfully submitted that Claims 1 - 3, 10 and 11 - 16 are in condition for allowance. Favorable reconsideration is respectfully requested.

Should the Examiner believe that anything further is necessary to place this application in condition for allowance, the Examiner is requested to contact applicants' undersigned attorney at the telephone number listed below.

Kindly charge any additional fees due, or credit overpayment of fees, to Deposit Account No. 01-2135 (500.40168X00).

Respectfully submitted,

ANTONELLI, TERRY, STOUT & KRAUS, LLP

By _____

Ralph T. Webb
Reg. No. 33,047

Attachments: Declaration of Kenichi TOMIOKA
Marked-up Copy to Show Changes Made
Table 2 (corrected)
Table 2 (marked-up)

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Table 2

			Example				Comp. Example				
			5	6	7	8	6	7	8	9	10
Formulation	Cyanate ester resin	ArocyB-30	100	-	100	100	100	100	100	-	100
		ArocyM-30	-	100	-	-	-	-	-	-	-
	Epoxy resin	DER331L	-	-	-	-	65	90	-	-	-
		HP7200H	95	70	95	95	-	-	-	-	95
		ESB400T	55	50	55	55	55	-	-	100	55
	Curing agent	HP850N	-	-	-	-	-	-	-	26	-
	Curing accelerater	Cobalt naphthenate	0.5	-	-	-	0.5	0.5	-	-	-
		Zinc naphthenate	-	0.5	-	0.5	-	-	0.5	-	0.5
		Manganese naphthenate	-	-	0.5	-	-	-	-	-	-
		2MZ	1	-	-	-	1	1	-	1	-
		2E4MZ	-	1	-	-	-	-	-	-	-
		C11Z	-	-	1	-	-	-	-	-	-
		2MZ-CNS	-	-	-	1	-	-	-	-	-
	Antioxidant	Pyrogallol	5	-	5	5	-	-	-	-	5
		Phenolic compound *1	-	5	-	-	-	-	-	5	-
Evaluation results		Specific dielectric constant (1MHz)	3.8	3.6	3.8	3.7	3.8	4.1	3.7	4.8	4.5
		Glass transition temperature (℃)	190	200	195	195	190	170	230	130	180
		Solder heat resistance	○	○	○	○	○	○	×	○	○
		Water absorption (%)	0.4	0.4	0.4	0.4	0.7	0.7	0.7	0.6	0.6
		Time elapsed till conduction break occurred (h)	>500	>500	>500	>500	280	280	290	>500	>500
		Flame retardancy (UL-94)	V-0	V-0	V-0	V-0	V-0	V-1	V-1	V-0	V-0

Formulation unit is part by weight.
*1: 4,4-thiobis-(3-methyl-6-t-butylphenol)

ATTACHMENT

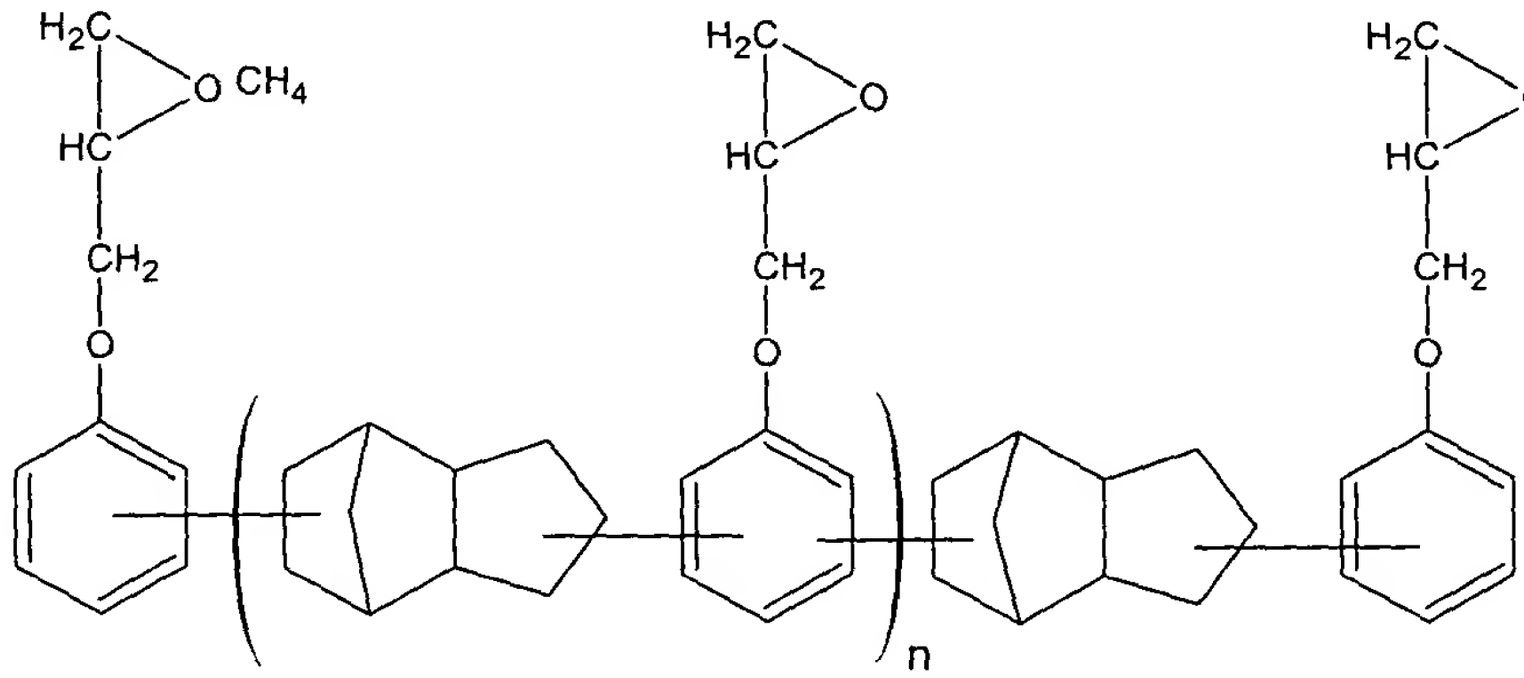
MARKED UP COPY TO SHOW CHANGES MADE

IN THE SPECIFICATION:

Please see Table 2 attached.

IN THE CLAIMS:

1. (twice amended) A cyanate-epoxy resin composition comprising (A) a prepolymer of a cyanate ~~type~~ compound containing two or more cyanato groups in one molecule thereof with a conversion of the monomer of 10 to 70 mole %, (B) an epoxy resin, (C) a curing accelerator, and (D) an antioxidant as main components, wherein the epoxy resin is derived from a dicyclopentadiene-phenol polyaddition product having a



dicyclopentadiene skeleton represented by the following formula (1):

(1)

wherein n is 0 or a positive integer,

and the curing accelerator comprises (i) a compound having a catalytic function to accelerate the curing reaction of the said cyanate ~~type~~ compound (A) and (ii) a compound having a catalytic function to accelerate the curing reaction of the epoxy resin,

wherein the epoxy resin (B) is contained in an amount of 50 to 250 parts by weight, the curing accelerator (C) is contained in an amount of 0.1 to 5 parts by weight and the antioxidant (D) is contained in an amount of 0.1 to 20 parts by weight per 100 parts by weight of said cyanate ~~type~~ compound (A).

10. (twice amended) A cyanate-epoxy resin composition according to Claim 1, wherein the compound having a catalytic function to accelerate the curing reaction of the cyanate ~~type~~ compound (A) is at least one of the organic metal salts or organic metal complexes of one or more of the metals selected from iron, copper, zinc, cobalt, nickel, manganese and tin, and the compound having a catalytic function to accelerate the curing reaction of the epoxy resin (B) is at least one compound selected from imidazole and its derivatives, organic phosphorus compounds, secondary amines, tertiary amines and quaternary ammonium salts.

11. (amended) A prepreg obtained by impregnating a cyanate-epoxy resin comprising

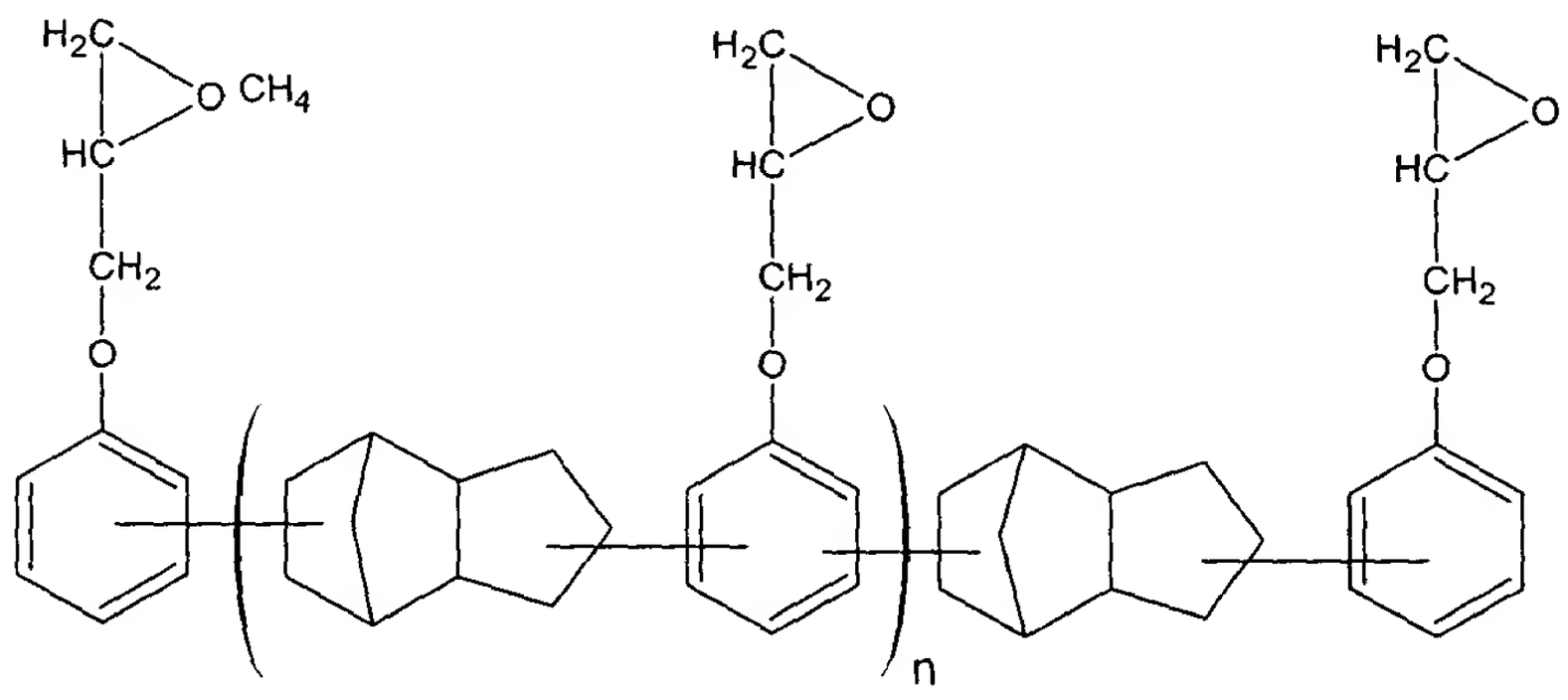
(A) a <u>prepolymer of a</u> cyanate compound containing two or more cyanato groups in one molecule thereof <u>with a conversion of the monomer of 10 to 70 mole %,</u> in an amount of 100 parts by weight,

(B) an epoxy resin in an amount of 50 to 250 parts by weight,

(C) a curing accelerator in an amount of 0.1 to 5 parts by weight, and

(D) an antioxidant in an amount of 0.1 to 20 parts by weight, as main components,

wherein the epoxy resin (B) is derived from a dicyclopentadiene-phenol polyaddition product having a dicyclopentadiene skeleton represented by the following formula (1):



(1)

wherein n is 0 or a positive integer, and the curing accelerator comprises (i) a compound (C) having a catalytic function to accelerate the curing reaction of said cyanate ~~type~~ compound (A) and (ii) a compound having a catalytic function to accelerate the curing reaction of said epoxy resin (B),

in a base, and drying the same.

12. (amended) A prepreg according to claim11, wherein the compound having a catalytic function to accelerate the curing reaction of said cyanate ~~type~~ compound (A) is an organic metal salt or an organic metal complex, and the compound having a

catalytic function to accelerate the curing reaction of the epoxy resin (B) is an imidazole compound.

16. (amended) A prepreg according to Claim 11, wherein the compound having a catalytic function to accelerate the curing reaction of the cyanate ~~type~~ compound (A) is at least one of the organic metal salts or organic metal complexes of one or more of the metals selected from the group consisting of iron, copper, zinc, cobalt, nickel, manganese and tin, and the compound having a catalytic function to accelerate the curing reaction of the epoxy resin (B) is at least one compound selected from the group consisting of imidazole and its derivatives, organic phosphorus compounds, secondary amines, tertiary amines and quaternary ammonium salts.

Table 2

			Example				Comp. Example				
			5	6	7	8	6	7	8	9	10
Formulation	Cyanate ester resin	ArocyB-30	100	-	100	100	100	100	100	-	100
		ArocyM-30	-	100	-	-	-	-	-	-	-
	Epoxy resin	DER331L	-	-	-	-	65	90	-	-	-
		HP7200H	95	70	95	95	-	-	-	-	95
		ESB400T	55	50	55	55	55	-	-	100	55
	Curing agent	HP850N	-	-	-	-	-	-	-	26	-
	Curing accelerater	Cobalt naphthenate	0.5	-	-	-	0.5	0.5	-	-	-
		Zinc naphthenate	-	0.5	-	0.5	-	-	0.5	-	0.5
		Manganese naphthenate	-	-	0.5	-	-	-	-	-	-
		2MZ	1	-	-	-	1	1	-	1	-
		2E4MZ	-	1	-	-	-	-	-	-	-
		C11Z	-	-	1	-	-	-	-	-	-
		2MZ-CNS	-	-	-	1	-	-	-	-	-
	Antioxidant	Pyrogallol	5	-	5	5	-	-	-	-	5
		Phenolic compound *1	-	5	-	-	-	-	-	5	-
Evaluation results		Specific dielectric constant (1MHz)	3.8	3.6	3.8	3.7	3.8	4.1	3.7	3.8	4.5
		Glass transition temperature (℃)	190	200	195	195	190	170	230	130	180
		Solder heat resistance	○	○	○	○	○	○	×	○	○
		Water absorption (%)	0.4	0.4	0.4	0.4	0.4	0.7	0.7	0.6	0.6
		Time elapsed till conduction break occurred (h)	>500	>500	>500	>500	280	280	290	>500	>500
		Flame retardancy (UL-94)	V-0	V-0	V-0	V-0	V-0	V-1	V-1	V-0	V-0

Formulation unit is part by weight.
*1: 4,4-thiobis-(3-methyl-6-t-butylphenol)